Space Weather Forecast

Issued on Friday, 26 July 2024 at 12:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storms Days 1 and 2 (26-27 Jul). Chance of R1 Radio Blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity was Moderate, with an M1.3 flare observed at 25/1537UTC from a region which has now rotated off the west limb and an M1.7 flare observed at 26/0442 UTC from a region located right behind. There are currently eleven sunspot regions on the solar disc. The largest and most complex region has now moved into the southwest quadrant. It continues to show a proliferation of spots in its leading and intermediate portions, a couple of which exhibit some complex magnetic looping. There is a cluster of small and relatively simple regions in the centre east. A new region has also emerged from the far side on to the northwest limb. All other remaining regions are small or simple.

A couple of minor Coronal Mass Ejections (CME) were seen leaving the sun on satellite imagery but none are considered to be Earth-directed. The first one was observed around 25/2240 UTC, shortly after a C-class flare originating from a region in the far southeast. The second one was observed around 26/0151 UTC, shortly after another C-class flare that came from a region that recently rotated off around the western limb. A small ejecta was also spotted around 26/0130 UTC but it was not sufficiently visible on satellite imagery to be analysed.

Solar Wind / Geomagnetic Activity: An unexpected CME most likely arrived at Earth early in the period. The solar rose from 330 km/s to 520 km/s, briefly peaking at 600 km/s around 26/0530 UTC. The total magnetic field was Moderate to Strong although it is now on the decline and back to weak. The all important north-south component became fairly erratic, with significant deviations. The net result of the above solar wind measures was for Quiet to Active (Kp1-4) conditions with a provisional G1 / Minor Storm (Kp5) interval observed 26/0300-0600 UTC.

Energetic Particles / Solar Radiation: Radiation levels have returned back to background levels after a period above S1 during 23 Jul following a large far sided full halo coronal mass ejection.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected, with a chance of further Moderate-class flares.

Solar Wind /Geomagnetic Activity: No coronal hole fast winds feature in the forecast period. A CME arrived at Earth on 25 Jul, the effects of which should begin to wane on Day 1. However, another CME may give Earth a glancing blow late on Day 1 or perhaps early on Day 2 (26/27 July). Geomagnetic activity is expected to be Unsettled to Active with a chance of G1/Minor storms intervals late on Day 1 and perhaps early on Day 2 (26/27 July). Any CME effects waning on Day 3 (28 Jul), with activity becoming mostly Quiet.

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Energetic Particles / Solar Radiation: There is a slight chance of rising above the S1/Minor Storm threshold in response to any notable flares throughout the period.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	40	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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